

TEXT BOOKS ON BOTANY.

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In response to a request by the Chief of the Weather Bureau, Mr. F. V. Coville, Chief of the Division of Botany, communicates the following suggestions:

With reference to books on botany, suitable for Weather Bureau observers, I would suggest that their interest in botany is likely to follow one of two lines: 1st. Physiological botany with special reference to agricultural crops and soils. 2d. Systematic botany with special reference to their local flora.

Among the various books on physiological botany I would recommend as best for this purpose one entitled *A Text-book of Botany*, translated from the German of Strasburger, Knoll, Schneek, and Schimper, which is published by MacMillan & Co., New York, at \$4.50. Another book, which though not primarily a publication on physiological botany, but nevertheless one of the highest utility in this line, is the three-volume, seventh edition of Storer's *Agriculture in some of its Relations with Chemistry*, published in New York, at about \$5. This is a book of the same character as Johnson's *How Crops Feed*, but covers the ground much more comprehensively, and brings the information authoritatively

up to date. In the matter of systematic botany I would recommend, as a preliminary text book for the learning of terminology and morphology, Gray's *Lessons in Botany*, published in New York, at \$1.10, and L. H. Bailey's *Lessons with Plants*, published by MacMillan & Co., at \$1.10. After going through either or both of these, the student will be in a position to use the various local floras as follows:

Northeastern United States: Gray's *Manual of Botany*, or Britton & Brown's *Illustrated Flora*, the latter published by Charles Scribner's Sons, in three volumes, at \$3 per volume.

Southern States: Chapman's *Flora of the Southern States*, published by the Cambridge Botanical Supply Company, Cambridge, Mass., at \$4. (Third edition.)

For the Rocky Mountains: Coulter's *Manual of Rocky Mountain Botany*, which may be secured at a cost of \$1.85.

For Texas: Coulter's *Botany of Western Texas*, published by the Division of Botany, U. S. Department of Agriculture, at 35 cents.

For California: Greene's *Manual of Bay Region Botany*, published by the author, at \$2. Brewer and Watson's *Botany of California*, issued in two volumes, published at Cambridge, Mass., at about \$10.

For the Pacific Northwest: *Flora of Northwest America*, of which about one-third has been published, and can be secured of Mr. M. W. Gorman, No. 75 Fourteenth street, North Portland, Oregon, at about 50 cents.

NOTES BY THE EDITOR.

PAMPEROS AND CYCLONIC STORMS.

The Pilot Chart of the North Pacific Ocean for June, 1899, contains a short article on a cyclonic storm at the mouth of the Rio de la Plata, October 20, 1897. By collecting the reports from several vessels and land stations, the author of this article has been able to draw a system of approximate isobars and winds for 10 a. m., October 20. This again illustrates the good work referred to in the MONTHLY WEATHER REVIEW for March, page 114, that can be done by the utilization of the great mass of material that is steadily accumulating in the archives of national hydrographic and admiralty offices. Many years ago large collections of manuscript log books were destroyed for lack of storage room. They represented the best work of navigators in sailing vessels on all parts of the ocean. Now that the tracks of steamers are so direct, it is questionable whether we shall ever again be able to accumulate ocean data in sufficient quantity to trace storm paths in the unfrequented portions of the ocean. And yet meteorology can not be properly studied without a daily weather map of the ocean as well as of the land. We must, therefore, hope that, both by individual and by combined efforts, the navigators and hydrographers will come to the assistance of the meteorologists and devise some method for the publication of the best daily weather chart that it is possible to compile in the present state of navigation. The Editor kept up such a daily chart to the end of 1895, for the most frequented portions of the north Atlantic Ocean; and it seems certain that a great chart of the Atlantic, like that for the year 1882, published by the London Meteorological Office, if continued for only ten or fifteen years, and even if published in only very limited numbers, would be a boon to the student of meteorology.

The Pilot Chart says:

The 20th of October, 1897, was marked by the occurrence, in the vicinity of the mouth of the Rio de la Plata, of a severe storm of the pampero type. This storm was due to the passage over Montevideo of a well-developed area of low pressure, which had its origin in the interior of the continent to the westward. At Rosario the pressure began to diminish at noon of October 17, reached its lowest point at 6 a. m., October 19, and had recovered somewhat at 10 a. m., October 20, when the pressure had risen to 29.54 inches, and the chart represents the condition of affairs at this time. Owing to the lack of observers, it is impossible to trace the progress of the storm center eastward after leaving the coast, but its effects were felt two days later by three vessels, which were at that time 25° in longitude east of Montevideo. Two well-marked types of the pampero may be distinguished, both

associated with areas of low barometric pressure: 1. The summer pampero, locally known as "turbanado," which may be described as a brief but violent thunderstorm, sometimes, indeed, of extraordinary violence. 2. The winter pampero or true wind from the pampas, the cold south-westerly gale which blows in the rear of the eastward-moving barometric depressions, varying in duration from a few hours to several days, and showing a close analogy to the "norther" of the Gulf of Mexico. The former type prevails during the period October to March, the latter from April to September, although the seasonal differences throughout these regions are not sufficiently pronounced to give a decided preponderance to either variety. During the spring months, October and November, this being the season of maximum frequency of pamperos, the number of each occurring is about the same.

The mariner sailing these waters should always be on his guard against the occurrence of these storms, for although their violence has been to some extent exaggerated, the winds rarely attaining full hurricane force, yet the frequent extreme abruptness of the shift from north to southwest, and rapid increase of wind, often renders measures of safety impossible, if delayed too long. The signs of the approach of the pampero are almost unmistakable. The storm is primarily due to the approach and passage of an area of low barometer, around which the winds circulate in a right-handed direction, or against the sun, at the same time drawing inward toward the center. The front or eastern half of the storm is therefore marked by falling barometer, rising temperature, warm northerly or northeasterly winds, and sky becoming gradually overcast with passing showers of fine rain. These conditions may prevail from one to three days. As the center or trough of the storm approaches, heavy cumulo-nimbus clouds gather in the southwest, quickly approaching and darkening the whole atmosphere. Flashes of lightning of startling brilliancy are also a frequent, although not an invariable feature of this period of the storm. The northerly winds continue to flow until the falling barometer becomes almost stationary, when a brief period of calm ensues, often accompanied, as in the present case, by a temporary partial clearing of the sky. The lull, however, is of short duration. Suddenly the pampero breaks with a squall of almost hurricane force from southwest, the barometer starts to rise, the rain ceases in a series of heavy showers, and the gale blows itself out from this quarter as the depression moves off to the eastward.

SPOOL KITES AND KITES WITH RADIAL WINGS.

At the recent meeting in Washington of the National Academy of Sciences Prof. Alexander Graham Bell described a number of experiments recently made by him with both the Hargrave and other forms of kites. The Hargrave kite of the style called by him the great Hargrave kite, was completed September 1, 1898, at his laboratory at Beim Breagh, N. S. It is about 11 feet long, 8 feet broad, and 4 feet deep, and consists of two of the regular Hargrave cells, 4 by 4 by 8, separated by a space of 3 feet. The "manhole" kite was

completed at the same laboratory September 6, and differs from the preceding principally in the proportions and the system of internal bracing. It is about 2 feet deep, 8 feet broad, and 8 feet long. The great manhole kite, or the Jumbo, was completed October 18, 1898, at the Beim Breagh laboratory. It is about 16½ feet long, 5½ deep, and 11 broad. The front and rear cells are rectangles 5½ by 5½ by 11 feet, and they are separated by a blank space of the same dimensions.

Before experimenting with these Professor Bell and his assistants had devised a large number of peculiar forms, which, although they may not be of much value to the meteorologist as a means of raising meteorographs to explore the upper air, yet are of great interest to the student of hydrodynamics as offering many interesting problems for his study. Some of these new forms Professor Bell denominates kites with radial wings. Others have, instead of wings or cells, various conical appendages or members, but all have the common characteristic that two similar members are separated by a rod whose axis coincides with the axis of the front and rear member, so that in general they may all be denominated spool kites; these fly by a cord attached at some point in the axis of the spool between the kite frames. All these forms were devised and used before June 24, 1898, and most of them are shown in the sketches given on Chart No. XI, where they are numbered as follows:

- No. 1. The two radial winged kite.
- No. 2. The three radial winged kite.
- No. 3. The giant three radial winged kite.
- No. 4. The four radial winged kite.
- No. 5. The five radial winged kite.
- No. 6. The two winged kite with conical tail.
- No. 7. The two winged kite with revolving fan tail.
- No. 8. Conical spool kite.
- No. 9. Conical spool kite.
- No. 10. Conical spool kite.
- No. 11. Conical spool kite.
- No. 12. Conical spool kite.
- No. 13. Conical spool kite.
- No. 14. Conical spool kite.
- No. 15. Semiconical spool kite.
- No. 16. Semiconical spool kite.
- No. 17. Double cone kite.

Of all these forms Professor Bell found the kites with three radial wings, Nos. 2 and 3, most interesting. The reader will notice that in all these kites the axis of the spool has an extra length, so that the two members may be set at different distances apart. The string by which the kite is flown is also adjustable at different points, so as to determine the best angle of flight. Photographs were taken of the four-winged and the five-winged kites when flying in the air, the string being attached to the top of a tall flagstaff; the appearance of the kites shows that the angles of inclination were not favorable to the attainment of great heights.

Perhaps the most remarkable kites were made by giving a twist to each of the three or four individual radial arms at each end of a spool, and allowing each set to revolve freely about the axis of the spool independently of the other set. This freedom to revolve seemed to make no difference in the flying, but decidedly increased the steadiness of the kite. The pull on the string was not sensibly diminished when the wings revolved, as compared with that when they were stationary. The angle of elevation of the kite string was not stated by Professor Bell.

Will it not be possible to add to the ordinary Hargrave kite a small fan driven by the wind to furnish motor power for use in connection with the self-registering meteorological apparatus? It would seem that the whirling fan does not add sensibly to the pull on the wire at the reel. In fact, it

is well known that this pull depends on the action of the wind on the long line of wire, even more than on the wind action at the kite itself.

NEWSPAPER FAKES.

It is frequently the duty of the Editor to enter into correspondence with those who contribute to the daily press circumstantial accounts of remarkable phenomena, such as ball lightning, falling meteors, tidal waves, earthquakes, hailstorms, showers of fishes, frogs, pollen, and numerous other quasi meteorological phenomena.

It would surprise the uninitiated to discover how many of these newspaper items are misleading exaggerations, and an intelligent man can but wonder how it is that so many sensational accounts of ordinary meteorological phenomena come to be published. Apparently the fault is not always with the editors of the newspapers, but lies with the news agents who have authority to write or telegraph to headquarters whatever they think will interest the readers of the paper or benefit the town that they represent. Thus, on May 2, a press dispatch from Vincennes, Ind., flooded the whole country with the announcement that—

Councilman ——— and Contractor ——— picked up the pieces of a snow-white flinty meteor whose external surface was of orange or yellow color. The meteors, for there were two of them, had struck some large stones in their fall and broken to pieces.

At the request of the Editor the voluntary observer of the United States Weather Bureau at Vincennes kindly obtained a piece of the stone and some further description of the event. The stone proves to be merely a fragment of a quartz boulder that had been discolored on the outside by red clay soil. If it fell as described, it must have been thrown from a distance by blasting or some other method. A fairly intelligent news gatherer or press agent might easily have seen that it had none of the characteristics of a meteoric stone and might have saved the people the bother and expense of telegraphing, printing, and reading his interesting little item. Our public schools generally teach enough science to enable a news gatherer to avoid being duped. There is no excuse for one who wilfully or ignorantly misleads his readers. If one perpetrates a fake or hoax in these small matters how shall we know when to trust him in the more important items of political and financial history?

While the Editor of the MONTHLY WEATHER REVIEW desires to secure interesting items, yet he does not wish anything fictitious or misleading. The voluntary and regular observers will confer a favor if, in sending him important newspaper items, they also add such criticisms of their own as will show the amount of credence to be given to the articles.

UNIVERSITIES AND METEOROLOGY.

The hearty interest in the progress of science that is felt in every branch of the Department of Agriculture is well set forth in an article by the Chief of the Weather Bureau, published in the Ohio State Journal for May 7. Among other things, Professor Moore said:

Meteorology is so interwoven with other natural sciences that we must look to the technically trained men of the future to explain many things of which we are now ignorant. This science presents to the student unlimited opportunities for theoretical investigations. At the same time it contains problems that engage the serious attention of practical men. A thoroughly equipped investigator should be, at least, a physicist, an astronomer, and a mathematician. As a rule, only graduates of universities and scientific schools have this educational foundation. This establishes a close relationship between educational institutions and the scientific departments of the Government. One is the training ground, the other an enlarged field of operations. * * *